# DRiVER

DECEMBER 1975

POOR RICHARD'S ALMANAC

- MAXIMIZING MILEAGE
- THE BACKYARD MECHANIC
- MISS DRIVER

# MINDLESS DRIVING

DRIVER

# angry, depressed, or elated

**— you need to be aware of your condition behind the wheel**

I've had it up to here, buster! The next time you pull a stunt like that, there'll be an empty bed waiting for you. Now butt out . . . go to work . . . get out of my sight!"

"Get off my case, woman!" Bill yells at his wife as he storms out of the house. Climbing into the family car he roars away – tires squealing – neither warming up the engine nor looking left or right.

"No broad's going to talk to me like that, even if I did work late again last night without calling her. Right?"

Bill's stomach churns, his brain swirls, and his mind is a picture puzzle of home life as he turns onto the highway toward base and a long day of work ahead. "Maybe I should get a divorce . . . no, that wouldn't be too smart . . . what'd happen to the baby . . . it'd probably screw up my next assignment . . . that woman's not going to push me around . . ." And on and on and on. Traffic conditions are the least of his worries.

We all get upset at times, some of us more often than others, some of us more upset than others. The problem seems to revolve around self-control. As long as we can control our thoughts and actions, or inactions, we'll probably be OK. Especially while driving. But do we . . . or can we?

DRIVER hit the books and talked to several specialists for some answers. We

min

# dless driving

came up fuzzy-headed but not empty-handed.

Bill may get to work in one piece, but he'll be lucky. In fact, the experts say there are millions of drivers of all ages and both sexes on the roads daily whose emotional problems literally cause mental blackouts. They become zombies, completely oblivious to what's going on around them. They drive automatically – their heads up and locked as though hypnotized. If something out of the ordinary happens, there's a good chance they won't react in time to avoid an accident. Or they may just wander out of their lane into a collision situation. And in more acute situations, their problems may be so

*continued*

# DRIVER

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**Certain individuals shown in this magazine are not members of the Air Force and therefore do not conform to Air Force grooming standards.**

THE EDITOR SPEAKS

## DOUBLE CLUTCH

### STAY ON THE ROAD!

No question about it—America's roads are among the world's finest. But what lies just beyond that pavement—where vehicles meet guardrails and median barriers with exposed ends, sign posts set in concrete, cement headwalls, bridge abutments, trees and utility poles—is a different story. We just read a report that *18,000 people* died last year when they ran off the road smack into roadside booby traps.

The General Accounting Office of the federal government says that in terms of saved lives, it's five times better to spend money on highway improvements than on new construction.

In response to such opinions, over a billion dollars was made available in 1973 for the states to carry out a three-year program for removing highway hazards. Probably because the states have to provide some matching funds before they get the federal money, the program hasn't moved along as fast as it might. But everywhere we're beginning to see new crash barriers going up, breakaway sign posts being installed, and other measures being taken to protect the wayward driver from that unplanned instant stop at the side of the road.

Unfortunately, new roads are still being constructed with known roadside hazards along them. So the best advice from here is: Stay on the road!

**NEXT MONTH**
**Snowmobiling**

continued

## MINDLESS DRIVING

depressing they actually consider using their vehicle as a suicide weapon.

DRIVER found that the likelihood of getting "up tight" is even greater during the Christmas and New Year's holidays. Life becomes more hectic. We play harder. We stay out later at night. We spend more. We drink more. We drive more. We become more intense. Personal relationships become more meaningful. And we become more sensitive.

Perfect setup for a "blackout" while driving, according to the shrinks.

A former Navy psychiatrist now practicing in California says that personal feelings run high during the holidays. Thoughts turn to the family.

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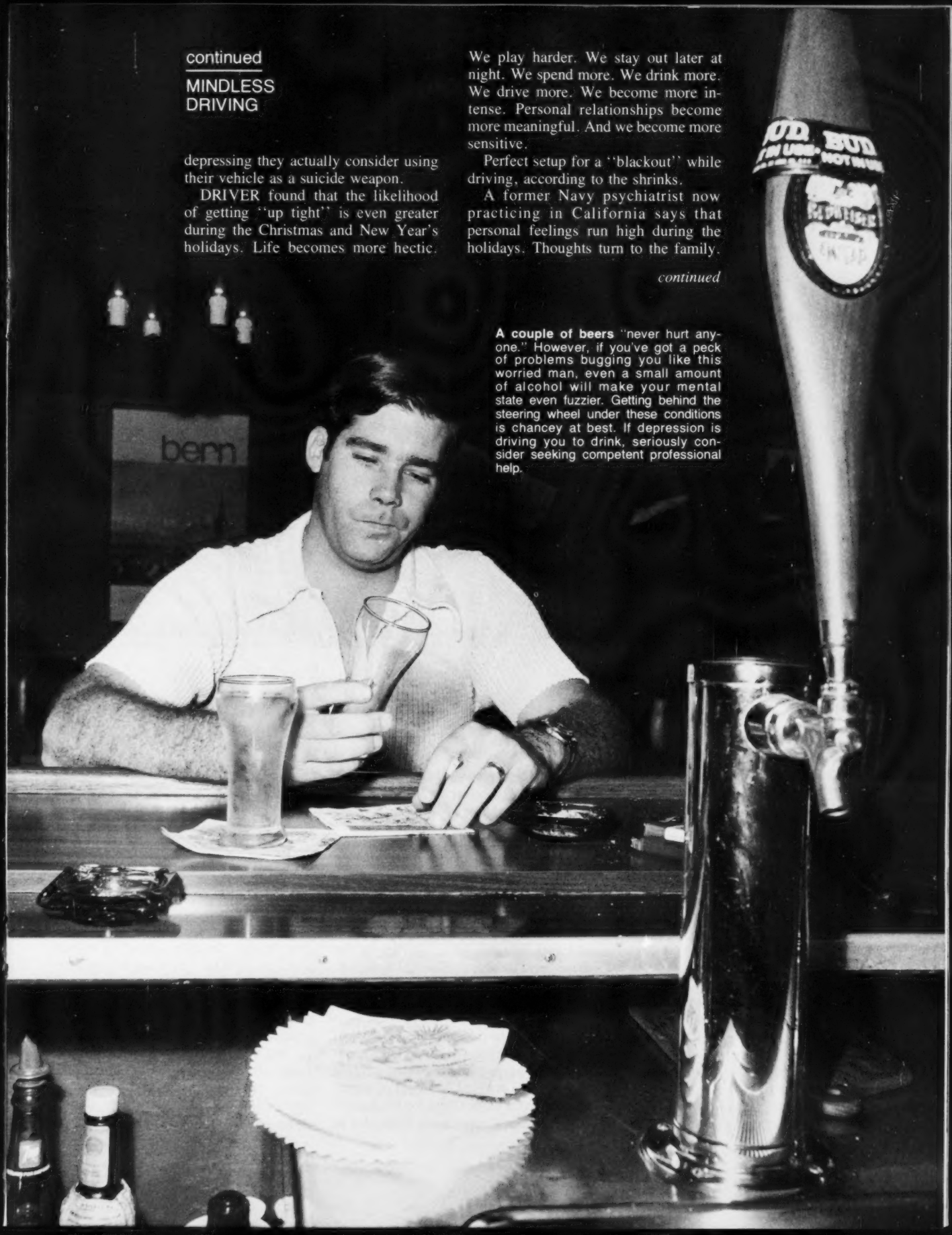



**A couple of beers** "never hurt anyone." However, if you've got a peck of problems bugging you like this worried man, even a small amount of alcohol will make your mental state even fuzzier. Getting behind the steering wheel under these conditions is chancey at best. If depression is driving you to drink, seriously consider seeking competent professional help.

continued

## MINDLESS DRIVING

Love and hate and all the other feelings and conflicts related to family life reach a peak then.

"We are less level-headed then," he says. "That's why holiday driving is such a problem."

Tensions, anxieties, hostilities just seem to explode when some of us get behind a steering wheel. Why?

The ex-Navy medic who worked with a lot of Marines while serving as the base psychiatrist at Camp Pendleton, California, claims that for most American males, the car is a symbol of masculinity.

"When a boy grows up in America, he can't socialize with women without a car," he explains. "The vehicle signifies his potency, his sense of worth. If you doubt it, just observe his depression when it's taken away from him or he wrecks it. You would think he'd lost an arm."

If that's true, then what about young female drivers? Women's lib to the contrary, he says that because their basic sex drive revolves around reproduction and children that they now have or hope for, the gals tend to be less aggressive in their behavior.

He quickly adds, however, that this isn't always the case. He's had women patients "fed up" over some misunderstanding at home who can't even remember driving to his office. They tell him driving gives them a "sense of liberation."

Just what causes tension? Well, besides our example of an argument with your marriage partner, you can be worried about any number of things: your health or that of a loved one; a

(far left)
When your mind is deeply occupied with matters other than driving you are in **real** danger—and so are those around you.

(left)
**"And just who do you think's going to pay** for some expensive chromed pipes that we need like a hole in the head?" Deserved or not, such static from his wife will shortly send this sergeant fuming away from the breakfast table and on to the highway . . . an accident just waiting to happen unless he can keep his cool.

school exam or upcoming promotion test; bad debts and bill collectors; rubber checks; doing poorly on the job; facing your boss; fear of being fired, demoted, transferred, discharged, or court martialed; a security violation; a traffic ticket; a bitchy neighbor; your kid's attitude toward you or someone else; the mechanical condition of your car; high prices of food and other essentials; your salary; the outcome of an election; not getting enough sleep or rest; your bowling score; sexual inadequacy. You name it – it probably can bug you.

Not all tensions are negative. You can be so charged up over the fact your favorite team's out in front for the Super Bowl, you've won a promotion, or your supervisor singled you out over others for special praise, that you will become equally spaced out behind the wheel.

Some medics also say that tension while driving can be good for you. "I think people should be concerned behind the wheel," declares one prominent psychiatrist. "It's a sign that they are alert and absorbed in what they are doing. It's the people who tell me they feel free of anxieties only when driving that concern me."

Some people become so angry inside, or depressed, that they purposely involve themselves in suicidal crashes. These are some of the so-called "mystery accidents" discussed in the November 1975 issue of DRIVER.

Suicide is the most hostile act in the world, according to one pro. It doesn't hurt you a bit; it's painless. But it hurts everybody you leave behind.

Another mind expert says the person most inclined to be involved in accidents, particularly fatal mishaps, generally has aggressive and self-destructive tendencies, is angry with himself and society, and rebellious toward law and order (especially motor vehicle regulations). He's the individual who takes unnecessary chances, drags, passes on hills, cuts in, becomes angry in traffic congestion, tries to beat the light.

OK, unless you're a candidate for the funny farm or you've just fallen off a turnip truck, there's something nearly everyone of us can do to "get it all together" on the highway.

Just being aware that we're angry or worried or elated is our primary tool for preventing a traffic accident. Awareness of the possible consequences of our emotions is imperative the second

*continued*

**"This checklist was MADE TO BE FOLLOWED, Sergeant!** Do you u-n-d-e-r-s-t-a-n-d?" A rough day on the flightline or a long, hot, dirty day on a combat exercise in the boonies can sap the patience of supervisors and supervised alike. Driving home after such a trying day is a challenge to the best of drivers.

continued

## MINDLESS DRIVING

we get behind the wheel. If we're really keyed up, we *shouldn't drive* and *should* get someone else to drive for us.

Since the records indicate it's not easy to forget our real life problems, and we're probably going to drive regardless, then you might try what some people do.

A *Los Angeles Times* reporter recently wrote that many freeway drivers use the privacy of their cars to scream away anger and frustration. Singer Dory Previn has told audiences she often does this.

This may sound weird, but the practice has a sound psychological basis. Many forms of psychotherapy focus on the relief you get from shouting, screaming, sighing, yelling, squirming, flailing your arms, etc.

Others relieve their tensions by singing or talking to themselves (ever notice another driver's lips moving even though he is the only one in the car?). Still others tune out their troubles by tuning in their favorite deejay, a talk show, or a newscast on the car radio.

Car pooling is another remedy. You not only save on gas and vehicle upkeep costs, you also gain someone to talk to. You may have to listen to the other person's problems or you may share yours; either way, you can let off a lot of steam.

If you're so depressed or angry that you've thought about suicide, then take DRIVER's sincere advice. Don't drive. Please consult a specialist as soon as possible, preferably a psychiatrist or psychologist qualified to handle your special situation. Your chaplain or almost any clergyman will also help you.

Driving while emotionally involved and in a "mindless" state is serious business. Just as long as you remain aware of this fact, you've taken the first step toward preventing a traffic accident.

So hang tough!

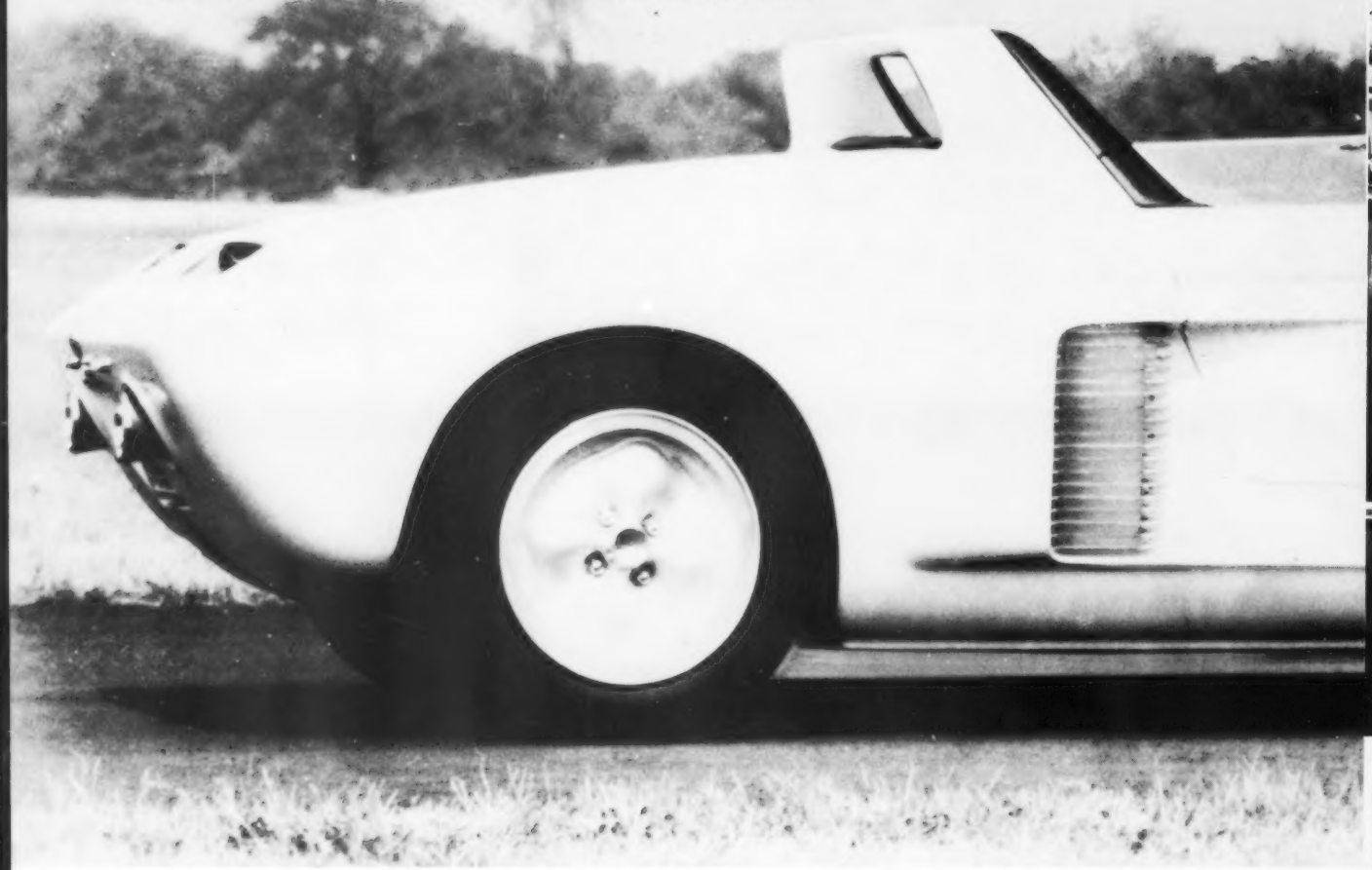
How often do you drive or ride in cars with three-point belt systems like this and simply fasten the lap belt but leave the shoulder harness neatly stowed? The fact is that you're not likely to be killed in a collision below 60 mph *if* you're wearing the entire seat belt-shoulder harness arrangement. Wear *both*, never just the shoulder part.

I hope you've noticed all the junk on the dash, the back floor, and hanging from the rearview mirror. In a collision, any or all of these things can become projectiles hurtling around your head with real force. Imagine getting smashed in the teeth by that empty gas can, or having that bottle of tire sealer driven into your eyeball! One thing your belts can't protect you from is all this sharp-edged junk. Incidentally, in many states you can be ticketed for hanging stuff from the mirror.

# MISS DRIVER

## VICTORIA COOPER

HOW TO HELP YOUR CAR SAVE YOU MONEY



# MAXIMIZING MILEAGE

In order to increase gas mileage and automotive economy, you must concentrate on three goals:

Decrease rolling resistance and aerodynamic drag.

Increase engine efficiency.

Improve your driving techniques.

This month we'll cover the first two objectives and will discuss driving techniques in a future issue.

## RESISTANCE AND DRAG

Rolling resistance is fairly easy to define. Remember how hard it was to push your car by hand the last time it ran out of gas? Friction was primarily responsible for the difficulty. After you had overcome the natural law that says, "An object at rest tends to remain at rest," then you had to fight friction in the form of (a) tires against the road, (b) wheel bearings, (c) dragging brakes, (d) universal joints, (e) differential, (f) transmission, (g) engine.

These last three represent most of the problem. It takes 20% of your engine's power just to overcome friction in the transmission and drive line. The use of proper lubricants can help eliminate this power loss, but not by much.

*continued*

This Mustang I was unveiled in late 1962 as the forerunner of the Mustang. The Mustang turned into a 4 place auto, and this car became the GT-40.

(above)
**This is a much more "slippery" shape.** Body styles similar to this are one reason sports cars achieve better mileage. Obviously, you can't take the family along in this, but it reinforces our point to buy the smallest car that will fit your needs.

(right)
**"Streamlining is important in reducing drag."** You can see some of the compromises designers must make. The hood and windshield are sloped to help reduce drag, but can you imagine how much horsepower it takes to overcome the drag caused by that massive frontal area?

Drag is a little harder to explain. Drag is "a measure of an object's ability to pass through a fluid." In this case, the ability of a car to pass through air. The less drag there is the less power needed to push the car through air. Therefore, a streamlined car is easier to move through air than a squarish sedan.

Some of the ways to decrease drag are: Sloping the hood and windshield, rounding angular body lines, and decreasing frontal area.

When you decrease drag, savings can be expressed as a savings in energy, or enabling increased speed with the same expenditure of energy. Of course, design limitations severely restrict efforts of automotive engineers to provide streamlined but still utilitarian passenger vehicles.

**REDUCING ROLLING RESISTANCE AND DRAG**

It has long been accepted as fact that running the air conditioner will decrease your mileage because it takes away usable engine power. That's true, but there's a catch. On late model cars, the ones with no vent windows (or no-drafts), if you open the front windows you create turbulence which takes more horsepower to overcome than is used by an air conditioner.

Tests by McDonnell-Douglas Aircraft Company's Transportation Division have shown it takes 2 horsepower to overcome the effect of open windows but only 1 hp to run an air conditioner at cruising speed. Around town, it's still economical to open the windows and shut off the air conditioner.

Reducing speed reduces drag, too. If you drive at 55 mph instead of 70 mph you can receive a 5 mpg bonus.

Front spoilers, those funny looking lips on racing cars, can increase mileage somewhat on passenger cars. Trucks and campers can benefit from curved spoilers installed on the upper leading edge of their vehicles.

You can make these out of aluminum or buy and install them yourself. Just be sure the radius of the spoiler is no more than five inches. Dimensions greater than this create more turbulence than they offset. Fuel savings for large trucks and campers may range from 5 to 7 percent.

Weight plays a large part in rolling resistance. Select the lightest vehicle you can to meet the requirements you have. A six-passenger car for a couple with no children is fuelish.

**TIRE TIPS**

Radial tires offer better mileage than

**Aside from the fact he's not in complete control of his car,** this driver is wasting fuel. At cruising speeds, an open window causes your car to consume more gas than using the air conditioner with the windows closed.

**You camper owners** can save some gas money if you fit a spoiler, of no more than five inches radius, along the upper leading edge of your camper. Just a curved aluminum plate installed along the width of this edge can increase your mileage 5 percent.

conventional bias-ply tires. The reason for this is not so much that they reduce rolling resistance but that the flexing of the sidewalls requires less energy. Bending and flexing of tire sidewalls and tread surfaces generate heat. The loss of this heat is called hysteretic loss or hysteresis.

In other words, it takes engine power to roll the wheels and build up the internal heat of the tire. Radials lose this heat much more slowly than bias-ply tires and therefore require less energy (in the form of gasoline) to keep them efficient.

We can further conclude that if we increase radial tire pressure two to four pounds, or to the manufactuer's recommended maximum, flexing and hysteretic loss become less, resulting in even less power required to drive the wheels.

This increase in pressure may result in a slightly rougher ride but will increase tread life as well as mileage. Be sure to check with your tire dealer though, before you decide how much to increase pressure.

**INCREASING ENGINE EFFICIENCY**

Since we're talking primarily about economy, let's discuss that before we get into efficiency. Saving money is the name of the game and anything you can do in that direction is beneficial. Engine wear costs money. A worn engine is inefficient – fuel-wise – and repairs cost money.

The key to engine wear is, basically, oil. Oil is to your engine what blood is to you. It carries away internal dirt, provides lubrication, brings additives to prohibit acid formation, and has a great deal to do with proper operating temperature. Let's dispell some oil myths:

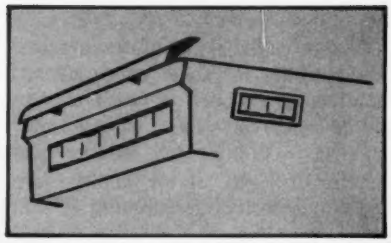
■ *Don't put detergent oil in an old engine.*

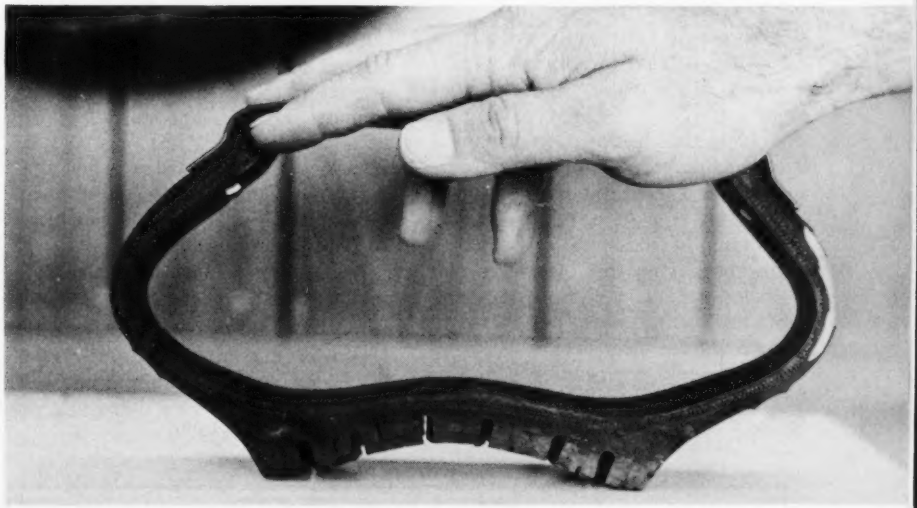
Not true – detergent oil will clean out varnish deposits and help keep

*continued*

(below)
**A conventional bias-ply tire** has its center tread influenced by weight applied to the sidewalls. If you translate this action to a car starting and stopping, you can see the continual up and down motion will prematurely wear the outer sections of tread by literally scrubbing them away. This costs money, not only for replacement tires, but in oil used to make new tires.

(bottom photo)
**In a radial tire,** the sidewalls have little effect on tread action. Tread wear is decreased, and gas mileage is increased because the horsepower needed to overcome "scrubbing" in conventional tires is not necessary with radials.





sludge in suspension in the oil so it doesn't cover the oil pickup. It keeps oil passageways clean so a full flow of oil can help carry away engine heat. If detergent oil cleans your old engine so well that you need a rebuild, consider that detergent oil only hastened the rebuild, not that it caused it.

■ *Oil filters keep oil clean so you can use it longer.*

The last part is false. Oil life is pretty much a function of time versus temperature and the amount of additive left in the oil. For each 10° over 260°F, oil life is halved. High temperatures burn away additives. Even though an oil filter will *clean* the oil, it will not necessarily prolong oil life.

■ *Dirty dipstick equals a dirty engine.*

False. Oil cleans the engine internally. It picks up soot, unburned fuel, moisture, varnish, and metal particles. If the oil appears dirty, it's doing its job and keeping the gunk in suspension so the oil filter can remove it. If the oil stays clean, something's wrong.

■ *Short trips make engines last longer.*

A large thumbs-down on that one! If the engine never gets up to temperature (at least 18 to 20 miles of driving) the oil never gets warm enough to evaporate the moisture and acids it picks up. Engine part clearances and tolerances are set for warm engines, and short trips won't allow the engine to operate at these clearances.

Also, a cold engine runs rich. Unburned fuel goes down the cylinder walls, dilutes the oil, and forms acids which attack metal parts. The unburned fuel in the oil won't evaporate 'til the oil is warm, so . . . you get the picture, short trips are super wasteful.

■ *Oil rated "SE" is the best.*

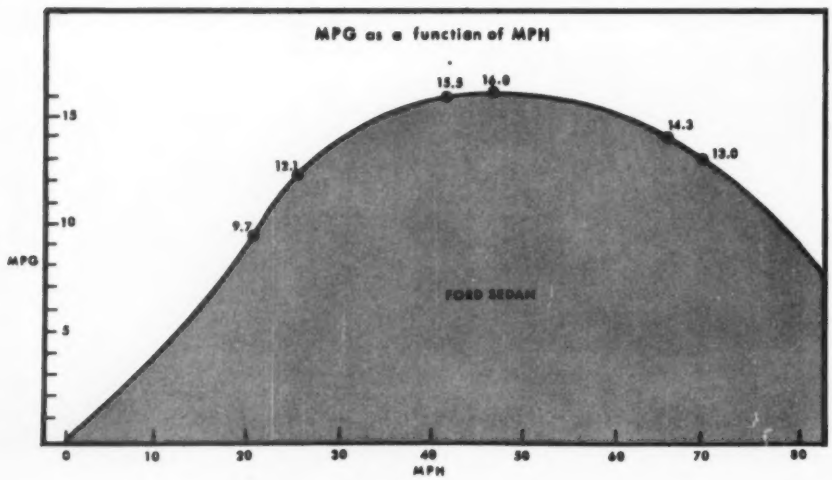
This is *not* a myth. Oil marked SE exceeds all manufacturer's requirements, and it's what you should use if you want to give your car the best of care.

OK, let's get back to engine efficiency. As we've seen, temperature plays a large part in engine efficiency. If the engine isn't warm enough, fuel won't vaporize properly and you'll need more throttle to get X amount of power. Ideal engine (water) temperature is around 190°F.

If the engine gets *too* warm, several things happen – none of them good. You could blow a waterhose, damage the water pump or thermostat, or cause the oil to run too thin and damage engine parts.

Don't overlook the possibility of burned valves, either. Those valves are right there in the combustion chamber where temperatures can run as high as 1200°F. The only way an exhaust valve is cooled is when it is seated (in other words, closed) and its heat bleeds off into the engine block and then into the coolant supply.

If the water temperature is too high, or the water level is insufficient, the heat can't bleed off, and edges of the valves, particularly the exhaust valves, will burn and crumble very quickly. This will result in compression loss and raise gas consumption.




Excessive temperatures are caused by many things – stuck thermostat, loose fan belts, bad water pump, low coolant level, rust or foreign matter clogging radiator tubes or water passages in the block – all of these.

Incorrect ignition timing can do it, as well as a too-lean gas/air mixture. A lean mixture takes longer to burn and may still be burning as it passes the exhaust valve. Too rich a gas/air mixture not only wastes gas, it can cause catalytic converters to work harder to burn the extra gas and thus overheat.

### THE CARBURETOR

Granted, we all know how much a carburetor can affect mileage if it's not adjusted properly, but usually it takes a mechanic with a fuel/air ratio meter to adjust it properly. Let's concentrate on what *you* can easily do to make it work more economically.

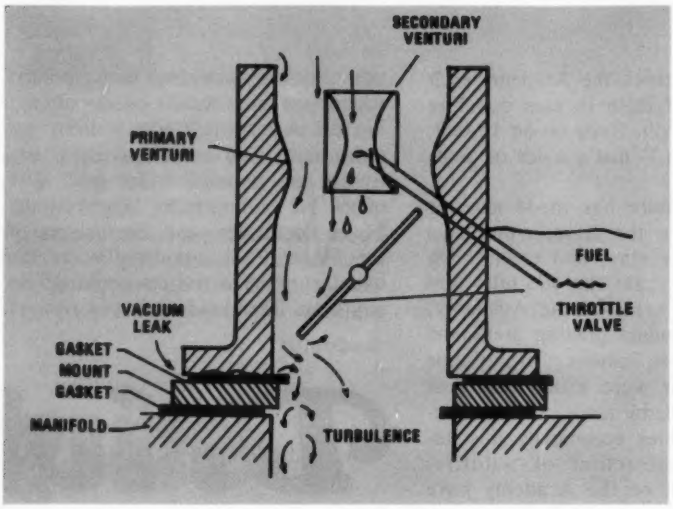
First of all, it is safe to assume that the carburetor is not properly mated to the manifold. Manufacturers' tolerances coupled with bored or inattentive assembly line workers can cause the carburetor to be mis-centered relative to the air passages in the intake manifold.

Chances are, the mating surfaces of carburetor-to-gasket or gasket-to-manifold have been dimpled during assembly, or the gasket itself is mispositioned. A little work on your part insuring integrity of the mating surfaces and correct positioning of the gasket can save you as much as 4 mpg.

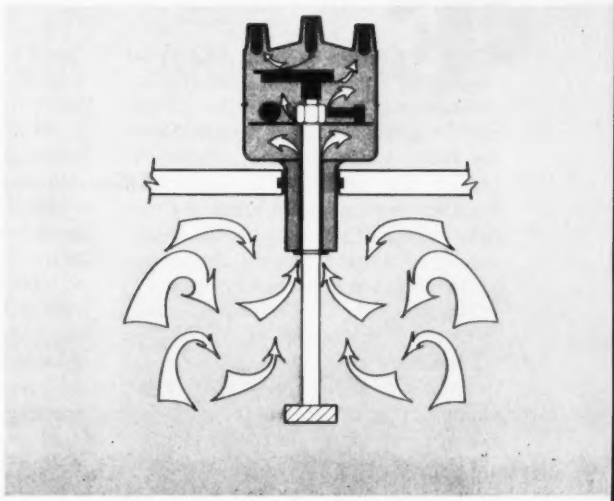
Another method used to increase mileage is to decrease the idle speed to a minimum. DRIVER does not recommend this method, however, because the vehicle will be pumping pollutants into the air in excess of government specifications while idling.

### THE IGNITION SYSTEM

Distributor maintenance for most of us usually consists of checking or changing the points, rotor, and condenser. The next time you do a major tuneup, though, you should consider installing a rebuilt distributor. Normal wear can make the distributor shaft bearings and seals go bad. Bearing wear will allow




**This simplified cross section** of a single-barrel carburetor shows how air flow restrictions caused by improper gasket adjustment can affect mileage. Even if the air flow in the primary venturi is lessened, the same amount of fuel is provided by the secondary venturi, creating a too-rich air/fuel mixture. You could possibly save 4 mpg by properly mating the carburetor to the manifold.



**If the distributor shaft seals are not in good condition,** fumes from the crankcase may be forced into the point area, shortening point life and promoting arcing and misfiring. A worn shaft may wobble and affect timing.

the shaft to wobble slightly making it difficult to time the engine correctly. It also allows the timing to change slightly as the engine runs and thus causes a slightly inefficient engine.

When distributor shaft seals are bad, fumes from the crankcase can be forced into the distributor where high voltage can ionize the air/oil mist and really shorten point life. A rebuilt distributor will cure both of these problems.

Many mechanics lubricate the point wick or rotating point cam with either the incorrect lube or too much lube. If you lube this wick or cam when you change points, be sure to get the correct lube. If you put too much lube on the point cam, it can be thrown from the cam during high-speed operation, get on the points, and cause them to burn or wear prematurely.

If you can reduce point wear you can go a little longer between tune-ups and you'll keep the points electrically efficient, resulting in some more money saved.

Old spark plug and coil wires should be replaced occasionally because they can have an increase in internal resistance which will result in less voltage to the spark plugs.

Spark plugs are the last and most important link in the ignition chain. Tests show that one misfiring spark plug can cause a 2½-mpg loss in traffic. As a spark plug ages, the edges and corners of its electrodes wear and the electrode becomes rounded. More energy is now required to cause the spark to jump the gap and this requires the coil to spend a few more milliseconds generating the extra voltage needed.

The result is a slightly late spark; so, even if your ignition is correctly timed, you are actually operating with retarded timing. This can cause the problems we've already talked about, such as burned exhaust valves and generally poor engine efficiency. You've got to keep those spark plugs clean and correctly gapped for them to operate properly!

OK, here's a list of things you can do:

- Properly mate the carburetor to the manifold.
- Use the proper grade and weight of oil for your operating conditions.
- Inflate your tires just that little bit more – to the max recommended by the manufacturer.
- Insure all vacuum lines and hoses are intact.
- Short trips kill your mileage – consolidate trips whenever possible.
- Insure the points are clean, unburned, and properly adjusted.
- Change spark plug wires every two years.
- Keep spark plugs clean and adjusted.
- Insure the heat riser and automatic choke assembly is unstuck and functioning properly.
- Install a flexible blade fan or fluid fan coupling.
- Change permanent antifreeze once a year. Rust or sediment in the cooling system can cause burned exhaust valves.
- Check thermostat operation.
- Check inside of tail pipe. White coloring means fuel mixture is too lean; black, too rich.
- Check wheel alignment.
- Adjust brakes for proper (minimum) drag.
- Grease wheel bearings regularly.

Accomplish any or all of these things and you can save yourself a bundle of gas and repair money, as well as doing your part to conserve energy.

*DRIVER wishes to thank Mr. Robert Allen and Douglas Aircraft Co., Long Beach, CA, for their major contributions to this article.*

# Drivi the

Every military installation has unique driving conditions of one sort or another and the United States Air Force Academy is certainly no exception. The nature of the Academy's mission, its location just north of Colorado Springs, Colorado, and its steady stream of tourists present continuous problems to the traffic safety people.

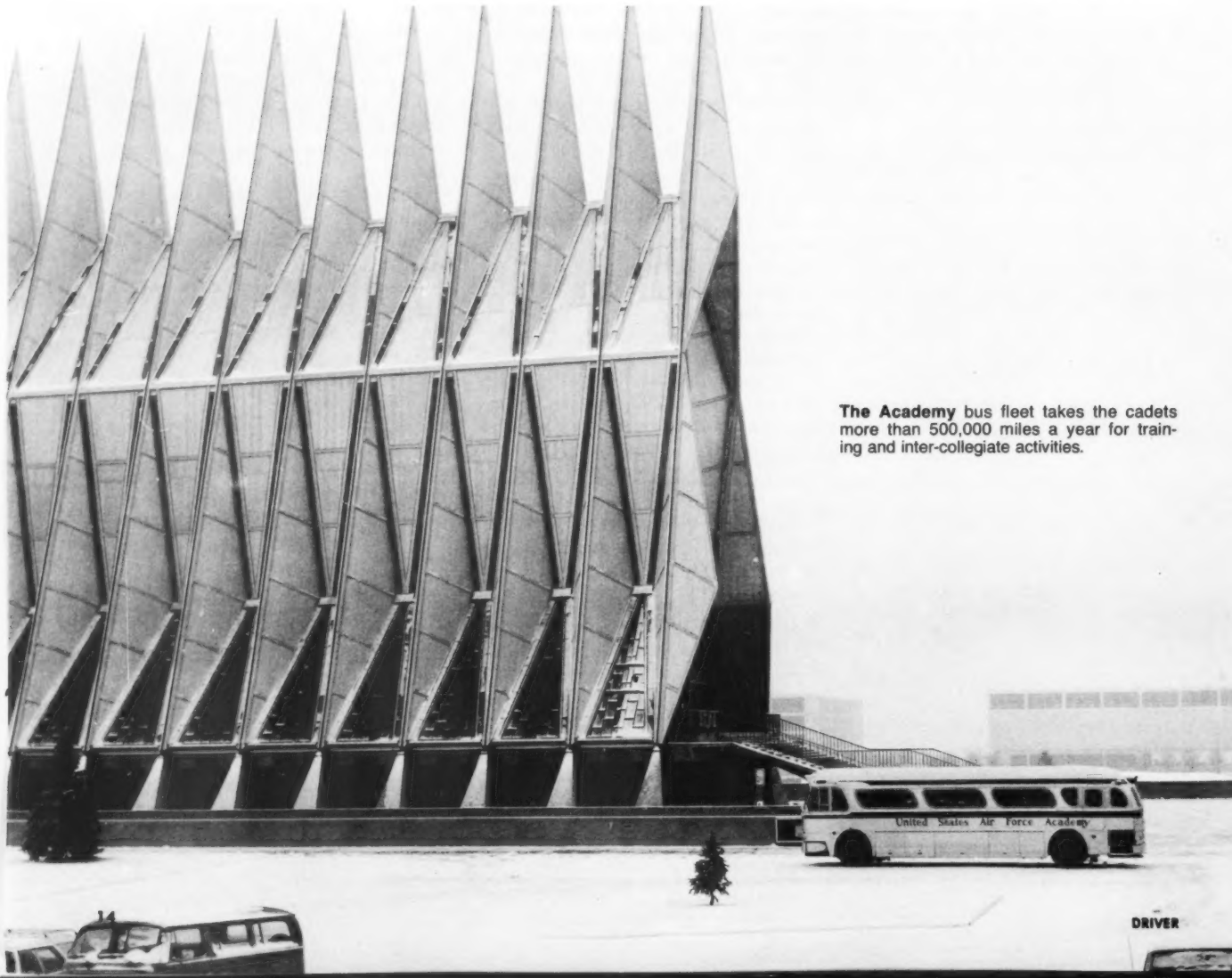
The Academy's facilities spread over about 18,000 acres in the shadow of the Rampart mountain range. Seventy-five miles of paved roads connect elevations from 6300 feet to 8000 feet and present road grades of up to 10%.

Frequent snows and icy road conditions during winter months are a real headache for the Civil Engineer's roads and maintenance workers.

Winter's natural driving hazards are replaced in the summer by another problem – tourists! Over a million visitors rubberneck the Academy each year, most of them in cars traveling at 40 to 50 mph. Even on an 18,000-acre "campus," that's a lot of folks dropping by.

Mother Nature has made another contribution to the driver's problems besides the weather and terrain. Up to 400 deer roam the foothills and mountainous areas of the Academy, enjoying abundant grazing areas and protection from hunters. Twenty-nine of these deer were killed last year crossing Academy roads. Costly damages to vehicles accompany this unfortunate destruction of wildlife, and motorists on the Academy have adopted the practice of flashing headlights to warn other drivers of deer herds on or near the roads.

These are some of the conditions the Academy's Vehicle Operations Division faces in providing transportation support to over 4,000 cadets attending the Academy. Cadet training requirements and extra-curricular activities are responsible for over 80% of the 1.2 million miles logged by the Motor Pool every year. The balance of the Motor Pool support goes to the usual support activities required on any base. The Academy's bus fleet of




**The Academy** bus fleet takes the cadets more than 500,000 miles a year for training and inter-collegiate activities.

by
**Lt Col CHARLES W. DEAN**
Director of Transportation,
USAFA

# ing at e Air Force Academy

26 diesel coaches provides most of the cadets' travel, not only on the Academy and within Colorado, but frequently for official activities in adjacent states when airlift is unavailable or impractical.

The Academy is particularly proud of this bus fleet for both its performance and appearance (seven of the coaches are 17 years old). The driver selection

*continued*

**There are almost 400 vehicles** in the Academy fleet and they travel more than three million miles a year. Pike's Peak is a nice background for the transportation complex.

and training standards are strict. Military drivers are used exclusively in the Bus Branch because of the constant contact with the cadets and the frequent requirements for transportation outside normal duty hours. Drivers are predominately Staff Sergeants and at least 25 years old.

Forty hours of specialized training are required to qualify a driver to operate the diesel coaches. This 40-hour behind-the-wheel training program is broken down into a minimum of 10 hours training on each of the four types of coaches assigned to the USAFA. The 26 coach fleet includes 1958 GMCs, 1965 Crowns, 1967 Flexibles and 1973 GMCs.

The purpose of the training is to insure that drivers are able to operate the coach with real skill and safety. Each trainee starts out with an already qualified operator and, as his proficiency progresses, he is allowed to transport passengers under the supervision of his instructor.

Training is conducted on-base, in the city and over mountain roads to include highway driving. A typical training session goes like this:

The trainee is initially given a briefing on the mechanical aspects of each of the four coach types. He then moves on to his basic driver coach training which starts on base, without passengers, until he is able to double-clutch and shift gears properly and smoothly. Then he's taken off-base for highway and city driving to points the cadets frequently visit, such as Denver. Once the trainee can maneuver the coach satisfactorily through city streets, he goes to the mountains. He needs practice on the narrow roads that wind through mountain passes often

covered with ice and snow, and in the heavy traffic around ski areas and mountain towns.

Once the trainee has demonstrated a satisfactory level of proficiency, he is road-tested, licensed and assigned a coach.

Each new operator also attends a two-hour minor maintenance briefing conducted by qualified maintenance personnel. This enables the operator to perform limited on-the-road maintenance. As a result, the Bus Operations Branch enjoys an almost zero "trip incompletion" record.

Training ends in a first aid class conducted by qualified personnel from the American National Red Cross. Each operator carries a card certifying that he is qualified to administer first aid to the injured.

When it comes to driving safety, the Academy practices what it preaches. It led the Air Force in 1973 and 1974 with the lowest military vehicle accident rate. The Motor Pool participates in the National Safety Council's competition for annual safety awards, and won first place awards in several fleet categories for 1973 and 1974, com-

*continued*

(left)
**Poor driving conditions** like this can develop without warning. This picture was taken in May.

(right)
**And here come** the tourists! Camera-owners can't resist the scenery.

(below)
**Danger ICY** Road sign means just what it says. Tickets for excessive speed for conditions are not unusual on Academy roads.

**Ice and snow** on roads with grades of up to 10% test the skill of the best of drivers.

continued

## DRIVING AT THE AIR FORCE ACADEMY

peting with over 2,000 vehicle fleets nationwide. Currently, eight of the Academy's Motor Pool drivers own "Million Mile Club" plaques.

The Vehicle Maintenance Division has made a big contribution to the safety record by providing top-notch professional maintenance service to the fleet. The Maintenance Shop also contributes to private vehicle safety by conducting a maintenance safety course for cadets, who are not allowed to have their own cars until their senior year. A $17,000 Clayton dynamometer installed in 1974 has been a big help in fine tuning vehicles for added mileage. An infra-red tester and opacity meter are used to insure that the Academy's vehicles always meet emission standards.

The Air Force Academy has become one of the leading tourist attractions in Colorado. Its modern facilities, scenic surrounding and refreshing atmosphere offer much to its visitors. If you've never seen the Academy, you ought to stop by.

**Snow plows** and sanders are frequent sights on Academy roads.

# TRAFFIC SAFETY
# SEEK 'N' FIND

E O I B L O W O U T I S L E E H W
S N O I S I V H T A I L G A T E N
N A I K E N R R E V I R D G H G O
E S F E R O N F S D A O R W A F I
C N L E I K L A W Y A J U S Y L T
I G F A T A L I T Y P Y N T R A C
L I H R U Y D A U T O S K H A R E
B S E K A R B J D U T E D G D E P
H S L S S A P E D E S T R I A N S
O W M T W B E B L D N R I L R K N
R A E O D P Y P A T I U V A I O I
N L T H S P A M G A S O E D P G F
E T A T S R E T N I L C R A S H O
P U E L K C U B S G O H D A O R G
I N T E R S E C T I O N S E L I M

**DIRECTIONS:** Locate these words related to highway safety in the square above. They may be horizontal, vertical, diagonal or backwards. The first word is marked for you.

auto
bike
blowout
brakes
buckle
courtesy
crash
driver
drunk driver
fatality
flare
fog
gas
go
helmet
horn
inspection
interstate
intersection
jaywalk
laws
license
lights
map
miles
park
pass
pedestrians
radar
roadhog
roads
safety belt
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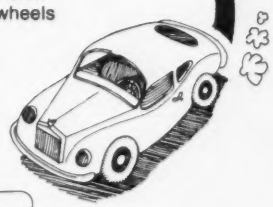
skid
speed
stop
tailgate
tires
tow
vision
wheels



drive friendly

courtesy Texas Governor's Office of Traffic Safety

# TUNING YOUR TWO-CYLINDER

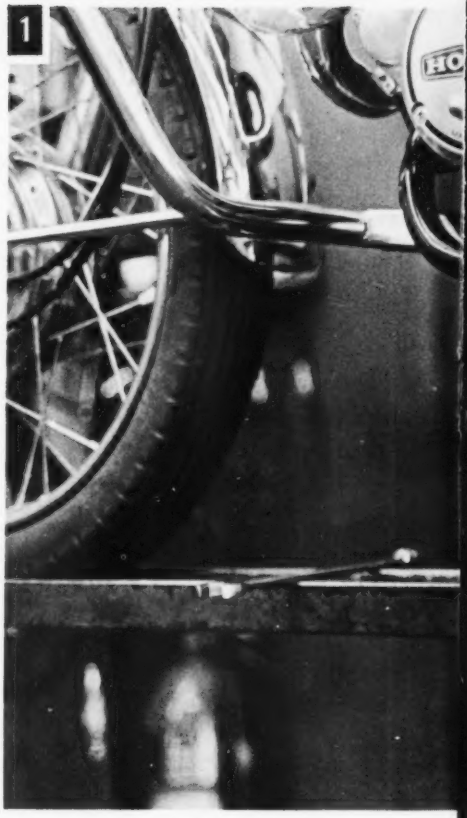
## A big step toward safe riding is a well-tuned machine

Tuning your Honda twin takes only a little of your time, and, done on a regular basis, it can save you quite a bit of money in the long run. Not only will you save the cost of tune-ups, but you'll receive the benefit of a smooth-running, efficient motorcycle that's inexpensive to own and operate.

The first item on the list is to consult your owners' manual. This book will give you all the specs you'll need, such as the correct amount of oil, how to change or clean the oil filter, where the timing marks are, etc. All the stuff you need to know in case you lose this issue of DRIVER.

DRIVER recommends starting any tuneup by changing the oil (pic 1). While the old oil is draining into a suitable container, take a rag and clean up the bike. Working on a dirty machine is no fun, and tools slippery with old oil have a habit of falling on your toes. Also, remove the gas tank (pic 2). You can't adjust the valves while it is installed. Take care to remove gas crossover lines (if you have them) and be ready to plug them. If you don't, you'll be standing in a puddle of Mr. Mobil's finest.

The next item is the cam chain adjustment. The adjuster may be either behind the cylinders or beneath the starter. Locate the adjuster and put one of the cylinders on top dead center (TDC). The method for locating TDC depends on whether your bike has a 180- or 360-degree crankshaft. Your owners' manual can tell you, if you're not sure. If the bike has a 360-degree crank, run either cylinder to TDC on the compression stroke, back off the adjuster lock nut and adjuster bolt, and the chain tensioner will automatically set itself. Screw the bolt back in until you feel tension on it, tighten the lock nut, and that's it. If you have a 180-degree crank engine, run the engine to TDC on the left cylinder, then continue another 90 degrees. At this point, the adjustment operation is the same as above.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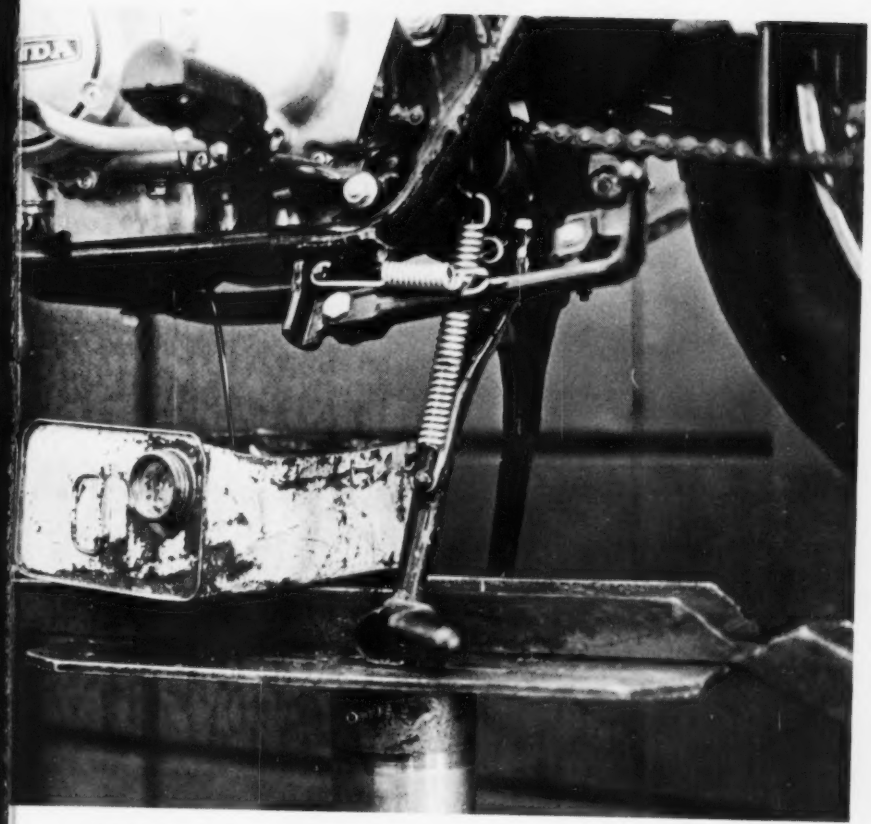
Let's move on to the valves. You should check your owners' manual for exact settings, but if you've misplaced that lil' devil, a good ballpark setting would be .05 mm for the intake and .08 mm for the exhaust. These settings are for a cold engine. OK, now remove the valve covers (pic 3).

On a 360-degree crank engine, run the left-hand cylinder to TDC. Do this by removing the alternator cover and turning the crank counterclockwise (pic 8). If you've removed the valve covers you'll be able to see the left-hand intake valve begin to open. Continue cranking until the valve returns to the closed position. Watch for the T mark on the alternator stator to align with the fixed mark on the case (pic 4). Voila! TDC on the left cylinder.

*continued*

2

# THE BACKYARD MECHANIC



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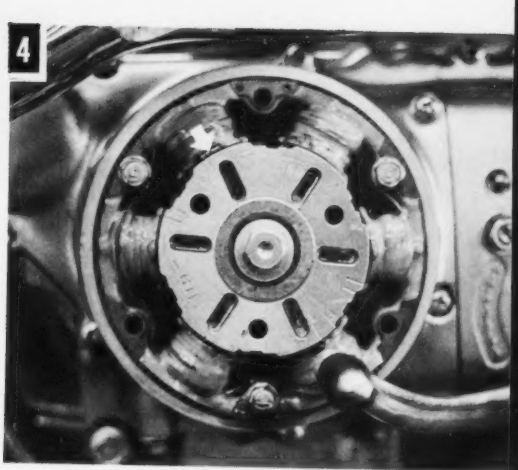


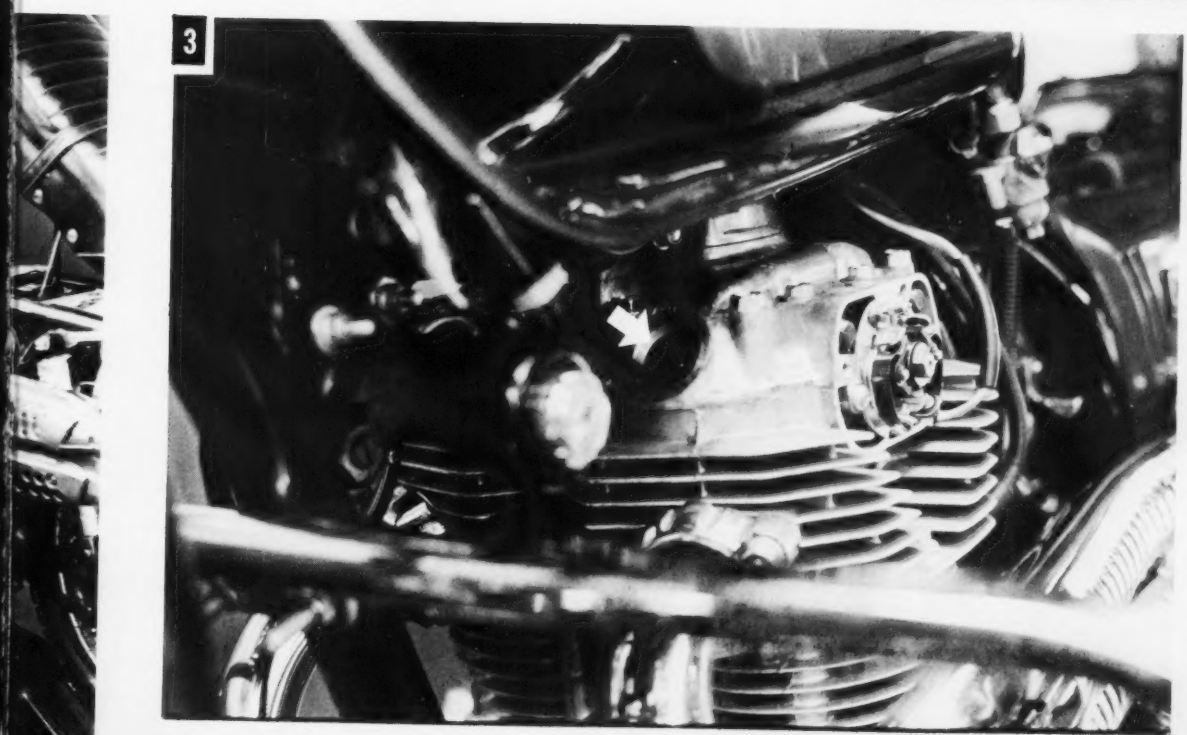

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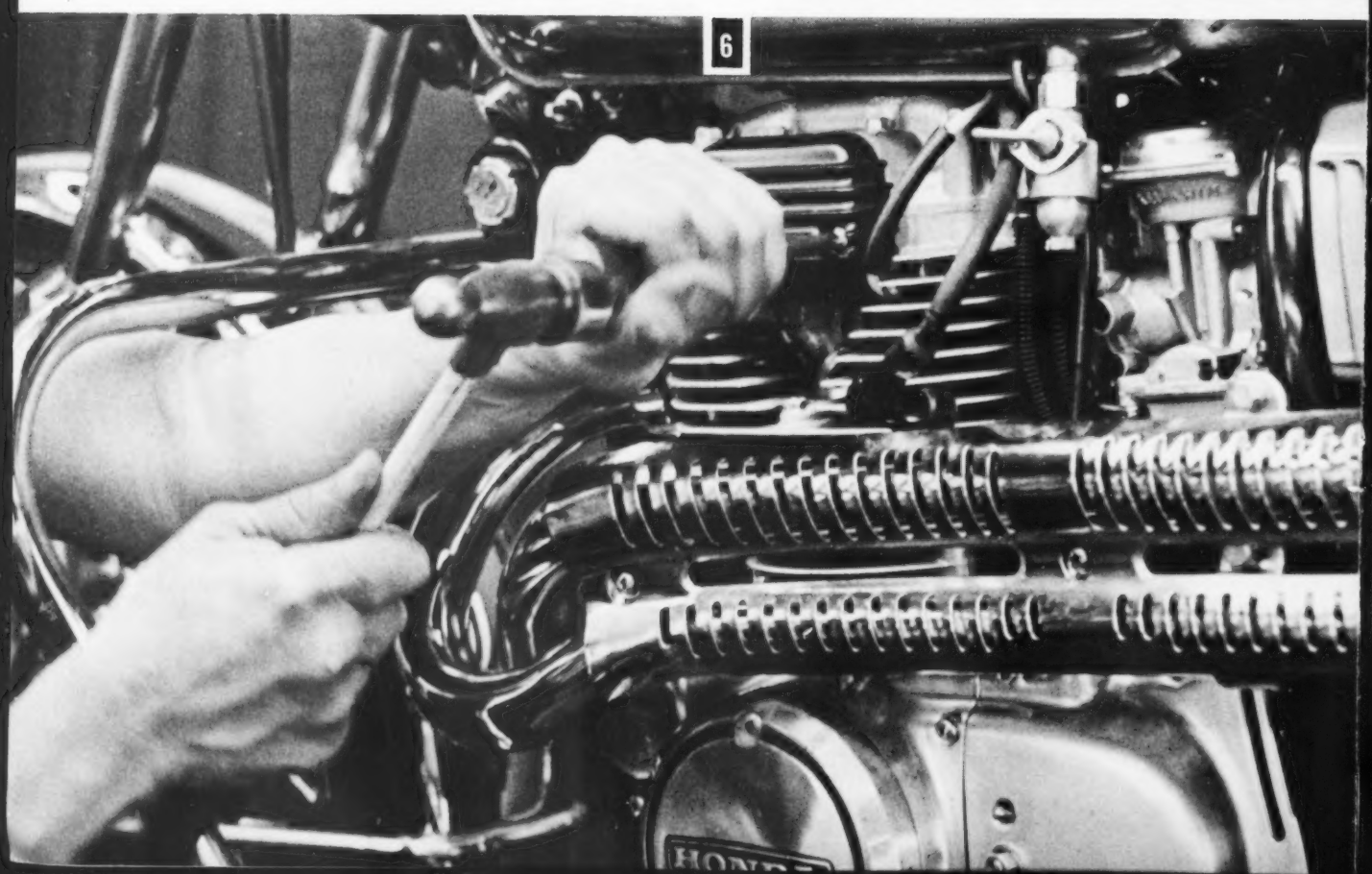

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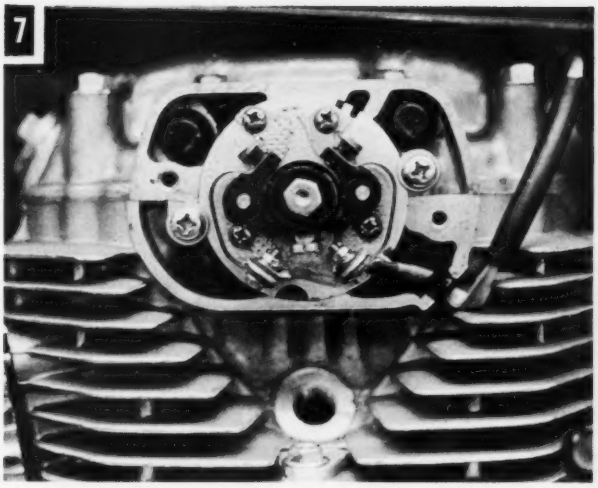
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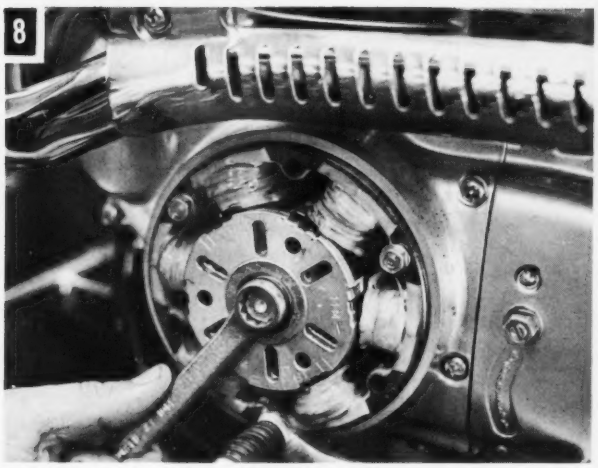
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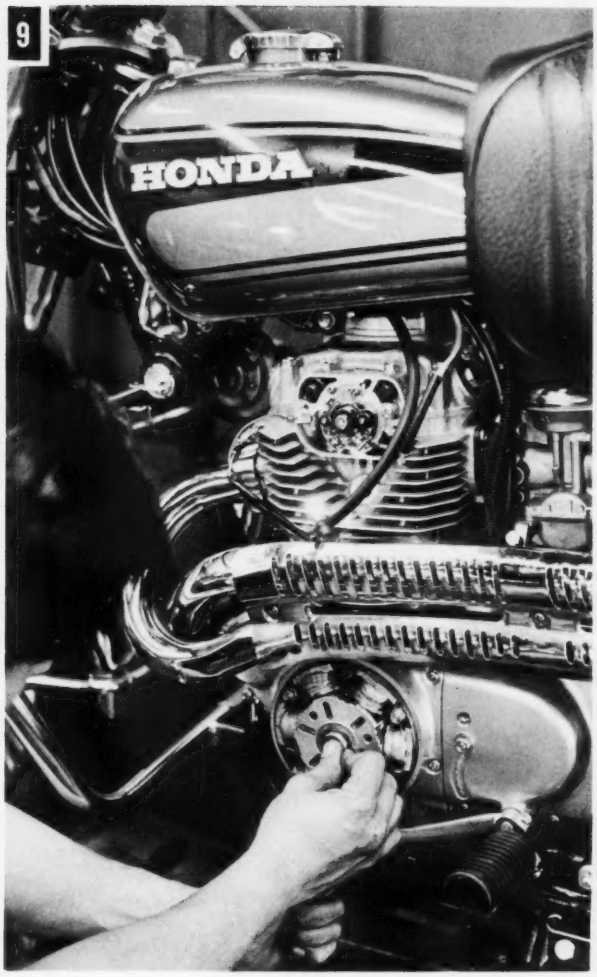

9

Set the valves by loosening the locknut on the tappet and sliding your metric feeler gauge between the tappet and the valve stem. Turn the adjuster until there is just a slight drag on the feeler gauge when moved back and forth (pic 5). Tighten the lock nut, and reinsert the feeler gauge for a double check. If the setting is ok, turn the crank 360 degrees and adjust the valves on the right cylinder.

The 180-degree crank engines are the same except that TDC for the left cylinder has a mark of LT on the alternator, and to do the right cylinder you just move the crank 180 degrees.

Moving right along, we come to point gap adjustment. Remove the point cover (pic 6), and rotate the engine until the points reach their most wide-open position. On twins with only one set of points, just slip the feeler gauge between the contacts.

Again using ballpark figures, you can set the points between .3 and .4 mm. Anywhere in that range will be adequate. On 180-degree crank engines (pic 7), set the left set of points first by running the engine to TDC and just a little (90 degrees) beyond. Then move the engine past TDC for the right cylinder and repeat.

The next to last step is setting the timing. On 360-degree crank engines, the ones with one set of points, move the crank to TDC of the left cylinder (compression stroke). On the alternator you should see an "F" approximately five degrees *before* the TDC mark (pic 4). This is the mark that indicates where your points *should* open. Use a buzz-box or light assembly (see November 1975 BACKFIRE column) to see if this is where the points actually do break (pic 9).

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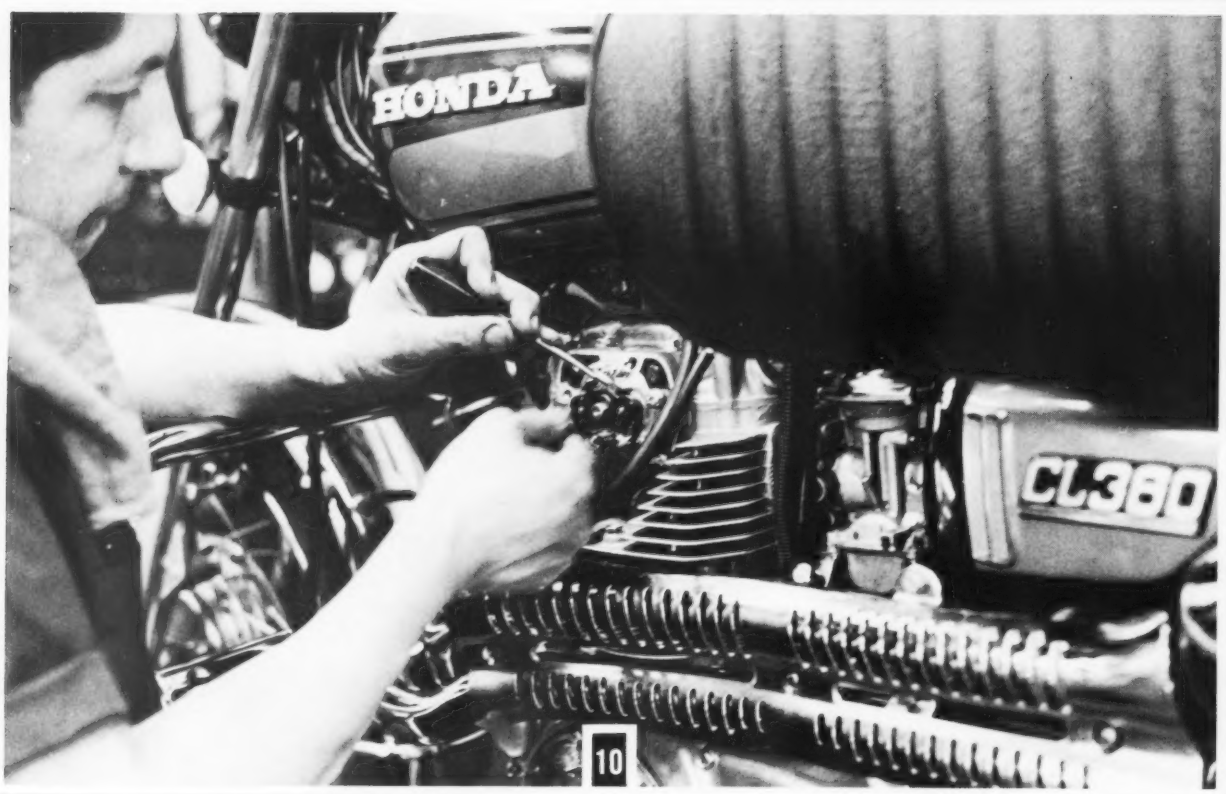



continued

## THE BACKYARD MECHANIC

If not, loosen the screws holding the point plate and adjust (pic 10) until the points open at the correct time.

Tighten the screws down and recheck, because you might have moved the plate when you tightened the screws. If the setting didn't change, you're in fat city.

Getting back to those good ol' 180-degree engines, set the points for the left cylinder first by running the engine to TDC on the compression stroke. The setting method is the same as above except that each set of points has a sub-plate that is used for the actual adjusting, not the entire point backing plate as in the single-point-set engines. Now turn the engine over 180 degrees and find the "F" mark next to the TDC line for the right cylinder.

Using your light or buzz-box, make sure this set of points is adjusted correctly. If not, set them by moving the entire plate.

Now the bad news . . . you'll have to check the other set again. Chances are it's now out of adjustment. After doing this back-and-forth act for a while, you'll probably figure out you need new points because the fiber rubbing blocks are worn. Well, we said it was gonna be cheap, we didn't say it was gonna be easy!

DRIVER advocates leaving the carburetors alone. They don't go out of adjustment very often, and many tuneups have been sold to owners who just "fiddled with the carbs a little bit."

The last step is to clean and regap the plugs or install new ones, replace the gas tank, put in the oil, and check for loose or missing bits and pieces. As with any job, if you've made a checklist and stuck to it, you shouldn't have any left-over gribbits, fennelators, or whatizzits. Your reward will be a clean running little twin that'll help you "meet the nicest people."

## New Pavement

The state of New York has been experimenting with a pavement surface that shows great promise of reducing skids during wet and icy weather. The open-graded asphalt contains stone aggregates of uniform size which allow water to flow through the upper one inch of the pavement rather than collecting on the surface.

Hydroplaning and vehicle splash and spray are also greatly reduced and pavement markings are more visible during wet weather on the new pavement. There is still some question, however, as to how durable the pavement will be, although it has given good service in Europe for many years.

## How to Check Your Speedometer at 55 MPH

Some states still have speed check areas along freeways to verify the accuracy of your vehicle's speedometer; however, since you no longer can drive 60 mph or a mile-a-minute legally, some motorists don't know how to use the check areas.

If you drive at 55 mph, it will take exactly 66 seconds to get from one mile post to another if your speedometer is accurate. At 50 mph, it will take 72 seconds. If the check area is three miles long, for example, the total driving time would be 3 minutes and 18 seconds at 55 mph or 3 minutes and 36 seconds at 50 mph.

Because of more rigid enforcement of the national speed limit of 55 mph by the states, an accurate speedometer may save you a traffic citation for speeding.

## Tire Wear

If you have belted tires on your car (either bias ply-belted or radial-belted) you may have noticed on your walk-around inspections that those tires mounted in a free-rolling position (front wheels on a rear-wheel drive car and vice versa) have developed a rather peculiar wear pattern.

It usually involves about the second rib from the sidewall of the tire. This particular rib is wearing much faster than the rest of the tread.

Rest assured, nothing is wrong. What you are seeing is a normal wear pattern for this type of tire construction. It is caused, says the Rubber Manufacturers Association, by the circumferential belts that are located immediately beneath the tread rubber, and the premature wear pattern does not affect the overall tread life. The effect is accented on radials.

Regular bias ply tires tend to wipe out this strange wear pattern.

The wear pattern does not signify improper wheel alignment. But, with radial tires, wheel alignment is more critical, so before you mount a new set of radials, make certain the front wheels are in good alignment, and if you have a car with independent rear wheel suspension, get those rear wheels checked, too.

As with all tires, whatever the construction, inflation pressures are vital. Get in the habit of checking them regularly. Once a week isn't too often.

## More RSVs

The Department of Transportation has awarded $6 million in contracts for the final design of an advanced state-of-the-art Research Safety Vehicle (RSV) to Calspan Corp. of New York and Minicars Inc. of California.

The results of the long-range RSV Program will be used as an aid in the establishment of safety standards for all cars in the mid-1980s. Light weight is a key requirement in both contractors' designs, with the Calspan car projected at 2,700 pounds and Minicars' design at under 2,000 pounds.

The Calspan five-passenger, four-door vehicle will employ front-wheel drive, using a sidewise mounted engine to produce an expected 30 miles per gallon. Engine emissions will be those required for 1982 operation by the Environmental Protection Agency. The design will stress accident-avoidance characteristics, overturning immunity, improved visibility, and a special occupant restraint system developed for the RSV, with protection in 50 mph frontal crashes.

Minicars' four-passenger RSV will be designed to get 37 mpg and protect its occupants from serious injury in accidents up to 50 mph. Weight saving is planned by using an unconventional sheetmetal box-frame structure with all voids filled with plastic foam. The Minicars' design also features air-cushion restraints for the driver and right-front passenger, radar-activated, high-performance emergency braking, a small on-board digital computer, and instrument readouts displayed on a TV screen.

## Drive Differently In Italy

The Army's Southern European Task Force reports more than the usual number of traffic accidents involving service people in Italy. They are urging Americans to remember that Italy is not their country and that they must adjust to Italian habits.

For instance, Italian drivers seldom stop for an amber light. They park on the sidewalk even though it's against the law. And they don't stop for pedestrians waiting to cross the street.

Italian law classifies two-wheelers as vehicles which are the equal of cars and trucks—they have the same rights in traffic. Many is the American who tops a hill to find three bicycles strung out before him and nothing he can do to prevent a collision.

Good old American driving habits must be broken if one is to make it through an Italian traffic circle. Quite simply, the law specifies that traffic already in the circle must yield to traffic entering. Completely the reverse of the way it's done at home. Safety Officers can't understand why it's so difficult for American drivers to accept, but newcomers hearing the screech of brakes behind them remember instantly that they should not have stopped before entering the traffic circle. It takes a long time to get over the doubt that the car in the circle really will yield the right-of-way to you when you enter.

If you're going to be driving in Italy soon, give it a lot of advance thought.

## About Miss DRIVER

*(See page 7)*

Would you practice your piano lessons if Victoria Cooper were your teacher? Tall and blonde, Vicki is an outdoor girl who loves tennis, biking and sailing. She really does teach piano. Her father is a retired Marine.

# BACKFIRE

**Address your letters to:**
**Editor**
**DRIVER Magazine**
**AFISC/SEDD**
**Norton AFB CA 92409**

**ABOUT THAT BIRD**

Although I enjoyed the First Annual Trivia/Nostalgia Test (Sep DRIVER), I believe the radiator cap on the Hispano-Suizas was a stork, not a swan. The stork was adopted in honor of "Les Cigognes" – the Storks – who flew SPAD aircraft with Hispano engines during World War I. They were, of course, the most famous squadrons in the French air service.

**Peter H. Granzeau**
Hampton, VA 23666

*The Technical Editor is embarrassed because several of you readers caught him with his birds mixed up. He says he's been fortunate enough to see and drive several Hispanos at Classic Car Club meets and every time it looked like a swan to him! He has promised more thorough research into such matters in the future.*

**DOES CLEANLINESS COUNT?**

I read and thoroughly enjoy your magazine each month. Now I have a question concerning car care that I feel you experts can best answer.

Exactly what (if any) would be the best procedure to utilize to clean an engine? Would I be wise to let some professional accomplish it for me? Is it ever necessary (i.e., does it improve performance)? Can I do it myself?

**Ens Richard W. Morgan, USN**
Luverne, AL 36049

*There are two occasions when a clean engine is important: First, if you suspect you have an oil or fluid leak. A clean engine makes leak trouble-shooting a cinch. Second, impending engine repair. Even minor repair work can be for naught if dirt, grease or old gasket material finds its way into the engine during reassembly.*

*In everyday use, a spotless engine compartment offers some advantages. Engine heat dissipation is better. Battery tops and connections will corrode less, and various fumes and smoke from hot grease or oil leaks can be avoided.*

*Also, the thin film of oil normally found on a dirty engine may cause ignition problems because the oil can cause the ignition current to "bleed off" distributor caps, plug wires, and even plugs, thus causing low ignition voltage.*

*Sure you can clean the engine yourself. Take the car to a quarter do-it-yourself car wash. Cover the coil and distributor with plastic "baggies" and stuff a rag in the air filter opening. Blast away. Avoid direct spray into alternator, generator, or on spark plugs. Remove the plastic bags and rag. If the car won't start when you're through, remove the distributor cap and dry the points and the inside of the cap. Remove the large wire on the coil and dry inside the well. Reinstall, and the car will start.*

*When you get back home, spray the engine and compartment with degreaser or similar* **safety** *solvent, not gasoline or kerosene! Allow the engine to cool an hour, respray and wipe with a soft rag. Of course, the engine will be dirty again next week.*

**ACCELERATION LANES**

Your article about freeways (Sep DRIVER) was great, except it doesn't work that way in Maryland! You say: If there's no acceleration lane (true in many places here), "it's still better to accelerate on the paved shoulder or outside emergency lane of the freeway than to slow down or stop at the end of the on-ramp."

That's nice, but several million Marylanders haven't gotten the message.

The official Maryland *Driver's Handbook* does say some good words about acceleration and deceleration lanes, and gradual merging, but a more enlightening statement it makes is: "Traffic on the main road has the right-of-way and in no manner should you interfere with that main flow of traffic. When you approach this (yield) sign, slow down so you can yield the right-of-way, stopping if necessary."

The local penalty for failing to heed that bit of wisdom is $1,000. Believe me, Marylanders do stop; they have to, because the guy thundering along the outside lane, with nary another vehicle in sight, won't move over an inch.

In Maryland, you approach a freeway with your foot on the brake, not on the gas pedal!

**Lt Col Joseph J. Blum, USAF**
Senior AF Rep.
U.S. Naval Academy
Annapolis, MD 21402

*The reference to the yield sign is important here. The kind of acceleration lanes we were speaking of don't have them. Incidentially, we hope we didn't leave the impression that the entering motorist has the right to interfere with the progress of a driver already on the freeway. He doesn't. The California Handbook says: "Enter the freeway at or near the speed of traffic. Stay with the traffic flow."*

# LETTERS TO THE EDITOR

**LONG HAIR**

Your magazine preaches that if you keep your automobile in tune, it will run more efficiently. I agree. You've given a lot of backyard mechanics valuable information to get their vehicles back on the road in peak operating condition.

I think Air Force people, like engines, need to be "tuned" to operate at peak efficiency. As an Air Force member who regularly reads and enjoys your magazine, I think that the airman pictured in "Opinions" (Sep DRIVER) could use a "hair mechanic" to be tuned in to Air Force standards. I think the mechanic in this instance should be his supervisor.

I know DRIVER wasn't developed to be used as a forum on hair, but I would like to say this: Consistent performance depends on the standards you use to "tune" the car, the truck, or the individual. There are plenty of car and truck repair manuals at the bookstore but there is only one Air Force Manual 35-10. Read it, use it, and the people who are "in tune" in your organization will appreciate it.

**MSgt William W. Jenkins, USAF**
Tinker AFB, OK 73145

*An awful lot of people have been on our case about that picture. The absolute truth is that on the photo proof sheet the long hair appeared to be part of the cap and we were plenty surprised when the magazine came off the press.*

**MOPEDS—FISH OR FOWL?**

What is the National Highway Traffic Safety Administration's ruling on mopeds? Are they bicycles? That's what Ground Safety here at Keesler AFB says. So does a newspaper article I read. But some Security Police don't agree. Remember, I said some, not all.

If mopeds are bicycles, can a base lay down rules saying that they will be treated as motorbikes so far as helmet, headlights on, and other rules are concerned? It seems asinine to be pedaling one wearing a helmet and with the lights on.

Many thanks. Do enjoy DRIVER whenever I can get my hands on a copy.

**TSgt Thomas H. Lohr, USAF**
Biloxi, MS 39532

*You aren't the only one who's confused about the legal classification of the moped. The Highway Users Federation predicts a controversy over how the states will legally classify the moped for traffic and safety purposes. Should they be registered? Should riders be tested, licensed, and asked to wear helmets? Should they be allowed on highways? Bicycle trails?*

*Notice we said "the states." This is not a problem to be handled by federal agencies. So far as Base rules go, yes, the commander must consider the moped a motorized two-wheel vehicle subject to the same rules as motorcycles.*

**CHECKLIST WHEN YOU MOTHBALL**

Concerning the article on mothballing an automobile (Sep DRIVER), one vital operation was left out. After a year or so overseas, the happy owner returns and suddenly realizes that he cannot remember all the pipes and openings he sealed so long ago. After a short drive he finds out the hard way that he left that towel under the valve cover.

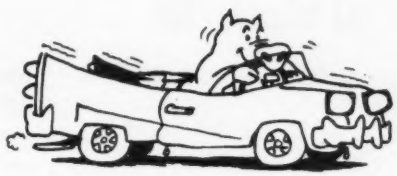
A checklist made out at the time of mothballing and *left with the vehicle* would eliminate this problem. I emphasize leaving the list with the vehicle to eliminate the possibility of loss during that interesting but usually hectic overseas tour.

**LCDR J. C. Kraft, USN**
Fleet Weather Central
NAS Norfolk, VA 23511

*First-rate advice. Sorry we didn't mention it in the article.*

**OUT OF THE WAY, GAS HOGS!**

From the Department of Transportation's own figures, and using their techniques, I draw the following conclusions: 72% of all motorcycle accidents are caused by negligent motorists; 2.5% of all motorcycle accidents are fatal. Therefore, the motorcycle accident rate and the fatality rate can be reduced by 72% just by banning automobile driving!



Since cars average 20 miles per gallon and cycles average 60 mpg, this would also cut our national energy consumption by 66⅔%. Not to mention reduced crowding of the highways.

**SSgt John A. Underwood, USAF**
Cannon AFB, NM 88101

*On the other hand, we get a lot of letters from motorists who say we can reduce motorcycle fatality rates by 100% by banning motorcycle drivers from the highways! Sgt Underwood's satistics are not entirely accurate so far as the Air Force is concerned: 60% of the motorcycle accidents that injure or kill USAF people are caused by errors on the part of the driver, not the cyclist. That's why DRIVER preaches to cyclists to make themselves* **visible** *in traffic.*

# Poor Richard's

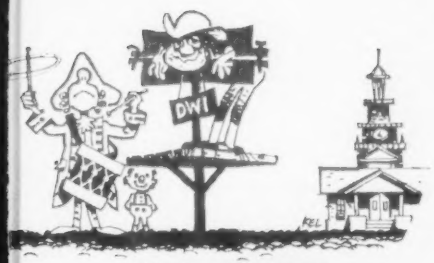
## by BENJAMIN FRANKLIN

| 1776 | 1976 | 1776 |
|---|---|---|
| Eating sour Pickles won't kill your Appetite. | Eating sour Pickles won't kill your Appetite, but Hydroplaning will. | Blessed is he that expects nothing, for he shall never be disappointed. |
| There are three faithful friends—an old Wife, an old Dog, and ready money. | There are three faithful friends—an old Wife, an old Dog, and Disc Brakes. | To lengthen thy Life; lessen thy meals. |
| A traveler should have a Hog's nose, a Deer's legs, and an Ass's back. | A traveler on a motorcycle should have a good Helmet, good Leathers, and Good Luck. | Drive thy business, or it will drive thee. |
| The sleeping Fox catches no poultry. Up! Up! | The sleeping Driver runs off the road. Wake Up! Up! Dumb-Dumb! | An egg today is better than a hen tomorrow. |
| A Flatterer never seems absurd. The Flatter'd always takes his word. | A flat never seems absurd. The Flatter it is the more it needs a good spare. | If your riches are yours, why don't you take them with you to t'other world? |
| Ill customs and bad advice are seldom forgotten. | Ill-built custom jobs and bad carburetors are seldom forgotten. | Visit your aunt, but not every day; and call at your Brother's but not every nite. |
| He that hath a trade, hath an Estate. | He that hath an automobile would be doing OK if he also hath an oil Well. | He that hath no ill-Fortune will be troubled with good. |

# BICENTENNIAL 1776-1976 Almanac

**In celebration of our country's bicentennial, DRIVER brings you some old sayings from Benjamin Franklin's "Poor Richard's Almanac." Scientist, author, inventor, philosopher and statesman, Ben Franklin was known in his day as the wisest American. One thing for sure, he'd have made a first-rate backyard mechanic.**

**We've taken the liberty of modernizing Ben's sage words to what he *might* have said had he been a 1976 motorist.**




| 1976 | 1776 | 1976 |
|---|---|---|
| Stupid is he that expects nothing to come of a drunk Driving rap. For he shall have the book thrown at him. | Here comes Glib-Tongue, who can out-flatter a Dedication; and lie like ten Epitaphs. | Here comes a used car Salesman, who can outflatter a Dedication; and lie like ten Epitaphs. |
| To lengthen thy life; fasten thy seat belt. | Fish and Visitors stink after three days. | Old Fish and driving on Wet Roads stink. |
| Drive thy Automobile or thy teen-age Kid will. | The things which hurt, instruct. | The things which hurt instruct. Like traffic Cops, traffic Tickets and traffic Courts. |
| A '56 Studebaker in good shape today is better than a '76 Mercedes tomorrow. 'Specially if you're an E-3. | I saw few die of hunger; of eating —100,000. | I saw few die of hunger; of automobile accidents—50,000 each year. |
| If your brakes are bad, have them fixed before they coast you someplace you'd rather not be. | The rotten Apple spoils his companion. | The rotten fan Belt spoils your engine. |
| Visit your Aunt, but not every day; and call at your brother's but not every night. 'Specially with gas at nearly six Bits a Gallon. | Half wits talk much but say little. | Half wits drive a lot and tell the judge they'll do better in the future. |
| The motorist that hath no ill-Fortune will be troubled with good Driving. | 'Tis easier to prevent bad Habits than to break them. | 'Tis easier to prevent bad driving Habits than to break them. |



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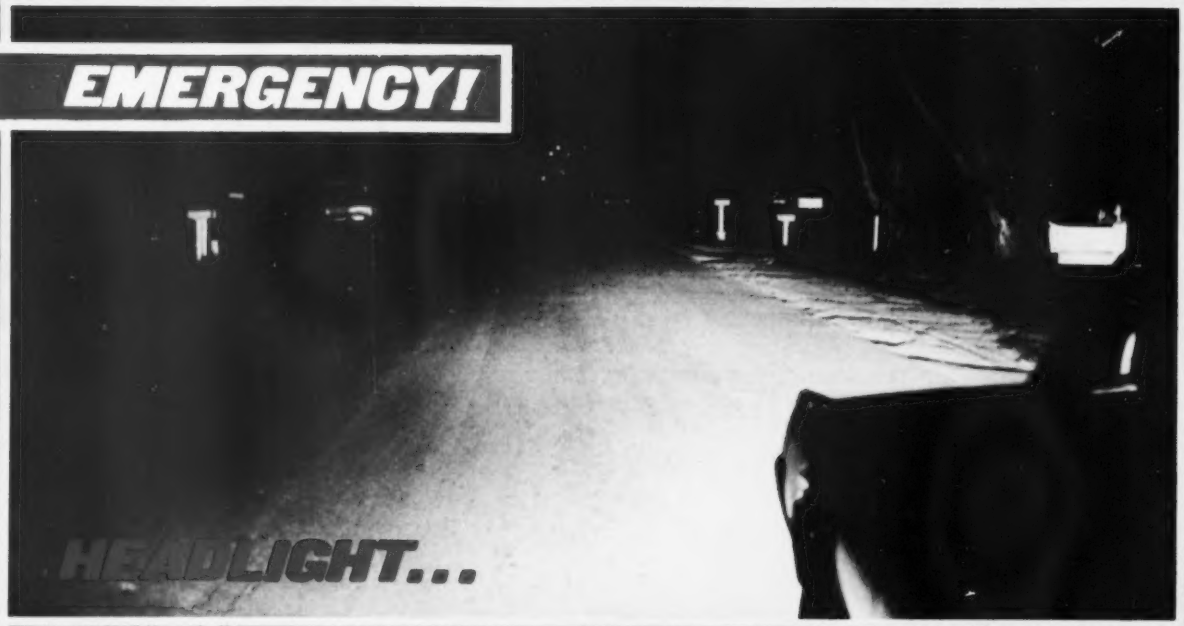
# EMERGENCY!



- Brake as quickly as possible without throwing the car into a skid.
- Ease onto the shoulder well away from traffic. Watch out for guard rails, trees, sign posts, cyclists, pedestrians.
- Set out warning devices—flares, triangles, or whatever you have.
- Check battery terminals for loose connection. If this is not the trouble, send for help.

**NEVER DRIVE IN THE DARK WITHOUT LIGHTS.**